

Automated Feature Extraction from Hyperspectral Imagery, Phase I

Completed Technology Project (2006 - 2006)



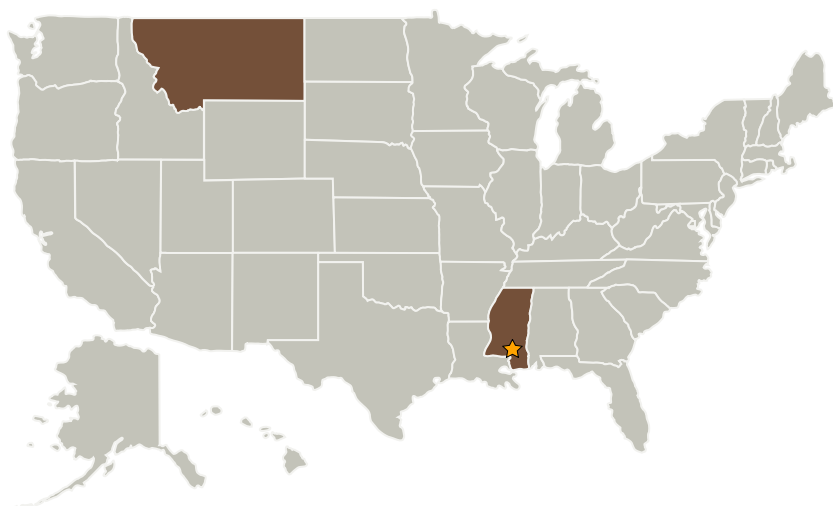
Project Introduction

In response to NASA Topic S7.01, Visual Learning Systems, Inc. (VLS) will develop a novel hyperspectral plug-in toolkit for its award winning Feature Analyst

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software that will (a) leverage VLS' proven algorithms to provide a new, simple, and long-awaited approach to materials classification from hyperspectral imagery (HSI), and (b) improve state-of-the-art Feature Analyst's automated feature extraction (AFE) capabilities by effectively incorporating detailed spectral information into its extraction process. HSI techniques, such as spectral end-member classification, can provide effective materials classification; however, current methods are slow (or manual), cumbersome, complex for analysts, and are limited to materials classification only. Feature Analyst, on the other hand has a simple workflow of (a) an analyst providing a few examples (e.g., pixels of a certain material) and (b) an advanced software agent classifying the rest of the imagery based on the examples. This simple yet powerful approach will be used as a new paradigm for materials classification. In addition, Feature Analyst uses, along with spectral information, feature characteristics such as spatial association, size, shape, texture, pattern, and shadow in its generic AFE process. Incorporating the best spectral classifier techniques with the best AFE approach promises to greatly increase the usefulness and applicability of HSI

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Visual Learning Systems, Inc.	Supporting Organization	Industry	Missoula, Montana

Primary U.S. Work Locations

Mississippi	Montana
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.6 Repurpose Processes